



UNIVERSITI PUTRA MALAYSIA

**ADOPTION OF INFORMATION TECHNOLOGY: COMPUTER
APPLICATION AMONG MALAYSIAN CIVIL SERVICE
EMPLOYEES IN SELECTED AGRICULTURAL
ORGANISATIONS**

YAZID ITHNIN

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APPLICATION AMONG MALAYSIAN CIVIL SERVICE
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**By
YAZID ITHNIN**

**Thesis Submitted in Fulfilment of the Requirements for the Degree of
Doctor of Philosophy in the Faculty of Educational Studies
Universiti Putra Malaysia**

June 2000



Dedicated to
Abang Soleh, whose brain surgery
was one of the traumatic moments
for the family members

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirements for the degree of Doctor of Philosophy

**ADOPTION OF INFORMATION TECHNOLOGY:
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YAZID ITHNIN

June 2000

Chairman: Hj. Bahaman Abu Samah, Ph.D

Faculty: Educational Studies

This study investigates factors that influence adoption of computer usage in agricultural organisations. Rogers' (1995) rate of adoption of innovations model was used as the research framework. The study focused on whether or not the adoption of innovation factors adapted from the model could explain and predict the computer usage adoption among employees of agricultural organisations in Malaysian civil service. The dependent variable was adoption of computer usage. The five independent variables were perceived attributes of computerisation, types of adoption-decision, communication channels, nature of social system and promotional efforts.

The study employed the survey research technique. Sampling was done by using the multi-stage random sampling technique in selecting 219 employees from six (FAMA, MARDI, DOA, LPP, BPM and DVS) out of 12 organisations. Respondents' usage of ten computer applications namely Wordprocessing, Spreadsheet, Data Base, Graphics, Presentation, Desktop Publishing, Statistical Data Processing, E-mail, Internet and other specific organisational applications,

were studied. Data were collected by mailed self-administered questionnaire. Both descriptive and inferential statistics were utilised in data analyses.

The study found that computer usage adoption level among all employee categories and in all organisations was low. The highest adoption level was in Wordprocessing and the least in organisational application specific to that organisation. Adoption pattern did not differ much among organisations. In terms of categories, 1.8% of respondents could be categorised as innovators, 25.1% early adopters, 48.4% early majority, 24.7% late majority and no laggards. Adoption behaviours were not significantly different in terms of organisations. The wider the coverage of promotional effort, the higher would be the adoption.

The four significant variables included in the stepwise multiple regression equation were network, social norms, interpersonal communication and intensity of promotional efforts. Together they explained and predicted 45% of the variance ($R^2 = .445$). Out of 25 sub-hypotheses from seven sets of hypotheses tested, 17 were found to be significant.

Finally, the adoption equation was predicted as:

$$Y = .596X_1 + .465X_2 + .178X_3 + .126X_4 + .085X_5$$

where Y (adoption of computer usage), X_1 (intensity of promotional efforts), X_2 (interpersonal communication), X_3 (network relationship), X_4 (social norms) and X_5 (complexity).

Abstrak tesis ini dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

**PENERIMAAN-GUNA TEKNOLOGI MAKLUMAT: APLIKASI
KOMPUTER DI KALANGAN WARGA KERJA PERKHIDMATAN
AWAM MALAYSIA DALAM ORGANISASI-ORGANISASI
PERTANIAN TERPILIH**

Oleh

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Jun 2000

Pengerusi: Hj. Bahaman Abu Samah, Ph.D

Fakulti: Pengajian Pendidikan

Objektif kajian adalah untuk menjelaskan faktor-faktor yang mempengaruhi penerimaan-guna komputer di organisasi-organisasi pertanian. Model kadar penerimaan-guna inovasi Rogers (1995) telah digunakan sebagai rangka kajian. Kajian ini memastikan sama ada faktor-faktor yang disesuaikan dari model Rogers itu adakah sesuai untuk menerangkan dan meramalkan penerimaan-guna komputer oleh warga kerja organisasi-organisasi pertanian dalam Perkhidmatan Awam Malaysia. Angkubah bergantung hanya satu iaitu penerimaan-guna komputer. Lima angkubah bebas yang dikaji ialah jangkaan ciri pengkomputeran, jenis keputusan penerimaan-pakai, saluran komunikasi, sistem sosial and usaha promosi.

Teknik kajian yang dijalankan ialah berbentuk kajian tinjauan. Kaedah persampelan yang digunakan ialah secara persampelan rawak pelbagai peringkat dalam memilih 219 warga kerja dari enam buah organisasi (FAMA, MARDI,

Jabatan Pertanian, LPP, BPM dan Jabatan Perkhidmatan Haiwan) daripada sejumlah 12 organisasi. Penggunaan aplikasi komputer oleh responden yang dikaji ialah Pemprosesan Perkataan (*Wordprocessing*), Helaian (*Spreadsheet*), Pengkalan Data (*Data Base*), Grafik (*Graphics*), Persembahan (*Presentation*), Sistem Penerbitan Meja (*Desktop Publishing*), Pemprosesan Data Statistik (*Statistical Data Processing*) E-mel (*E-mail*), Internet serta aplikasi khusus dalam organisasi. Data dikutip dengan menggunakan borang soalselidik-isi-sendiri yang diposkan. Kaedah statistik *diskriptif* dan *inferensi* telah digunakan dalam analisis data.

Kajian ini mendapati tahap penerimaan-guna komputer di kalangan semua warga kerja dan dalam semua organisasi adalah rendah. Tahap penerimaan-guna yang tertinggi ialah dalam aplikasi Pemprosesan Perkataan manakala yang terendah ialah dalam aplikasi khusus bagi sesuatu organisasi berkenaan. Dari segi kategori, 1.8% daripada responden boleh dikategorikan sebagai *peneroka-perubahan*, 25.1% *penerima-awal*, 48.4% *majoriti-awal*, 24.7% *majoriti-lewat* dan tiada (0%) *ketinggalan/'kayu mati'*. Perlakuan penerimaan-guna tidak berbeza secara signifikan dari segi organisasi dan tempat kerja. Dalam semua organisasi, semakin luas liputan usaha promosi dalam pengkomputeran, semakin tinggi penerimaan-gunanya.

Empat angkubah yang signifikan yang dimasukkan dalam persamaan regresi pekali berperingkat adalah jalinan, norma sosial, komunikasi perseorangan dan kekerapan usaha promosi. Secara bersama, angkubah-angkubah ini menjelaskan dan meramalkan 45% daripada sisihan penerimaan-guna ($R^2 = .445$).

Daripada 25 pecahan dari tujuh set hipotesis yang diuji, 17 daripadanya adalah didapati signifikan.

Sebagai kesimpulan, persamaan penerimaan-guna adalah dianggarkan sebagai:

$$Y = .596X_1 + .465X_2 + .178X_3 + .126X_4 + .085X_5$$

di mana Y (penerimaan-guna komputer), X_1 (kekerapan usaha promosi), X_2 (komunikasi antara perseorangan), X_3 (hubungan jalinan), X_4 (norma sosial) dan X_5 (kesulitan).

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I certify that an Examination Committee met on 23rd June 2000 to conduct the final examination of Yazid Ithnin on his Doctor of Philosophy thesis entitled "Adoption of Information Technology: Computer Application Among Malaysian Civil Service Employees in Selected Agricultural Organisations" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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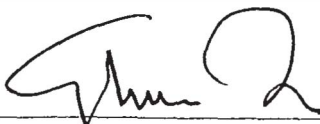
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Date: 13 JUL 2000

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or currently submitted for any other degree at UPM or other institutions.

Signed


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Date: 3rd July 2000

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LIST OF ABBREVIATIONS

IT	-	Information Technology
FAMA	-	Federal Agricultural Marketing Authority
MARDI	-	Malaysian Agricultural Research and Development Institute
DOA	-	Department of Agriculture
LPP	-	National Farmers' Organisation
BPM	-	Bank of Agriculture, Malaysia
DVS	-	Department of Veterinary Services
ANOVA	-	Analysis of Variance
S.D.	-	Standard Deviation

CHAPTER I

INTRODUCTION

The world has been witnessing an ever changing environment and new challenges. The economy is becoming more complex, elaborated, integrated and borderless. The market globalisation, increasing competitiveness, failure of socialism, awareness of natural resources conservation and of more recent development in the age of information technology (IT) are some of the changes. Information technology can simply be defined as the scientific, technological and management disciplines employed in handling and application of information. The origin of IT has its restricted area of data generation, processing and distribution of information. The main theme was confined to collection, storage, processing, dissemination and use of information. Both hardware and software are the means. Later it broadened into 'informatics' with greater interest in human aspects like quality, value and utilisation of information. The human factor is being placed as most important in the sense that the goal is being set for the technology and the values involved in making choices. As such, there is the underlying assessment criteria used to decide whether man is controlling the technology and is being enriched by it (Chartrand and Morentz, 1979).

The innovations in information super-highway and the speed of knowledge acquisition provide for the increasing globalisation. With the reduction in geographical barriers, appropriate and prompt decision-making in response to

competitive changes, swift international marketing is made possible. The mobile factors of production operate increasingly towards homogeneity in economy. Factors such as labour, investments and information flow increasingly and freely. However, the success of a nation does not merely depend on factor endowment or comparative advantage the nation enjoys. The competitive advantage of the nation, of which knowledge and information are the key determinants, plays a central role. Command of information can speed action to specific issues, to formulate strategies, to adapt, create and be ahead in order to remain competitive. Behind it all is the human being that constitutes the all-important resource by which knowledge, information and technology drive the nation forward.

Information technology is synonym to computerisation and office automation. Making use of IT is usually facilitated by computer usage. With computer usage, significant benefits can be achieved in terms of flexibility to both various demands and increased effectiveness. Routine work can be rationalised with computerisation. Large data volume is electronically processed in little or no time, with much reduced cost in the long run. Job opportunities of clerical workers may be affected since computers can take up the tasks normally carried out by the workers. These changes are causing many organisations to restructure their strategies, work culture and modes of operation. The tremendous need to accommodate recent changes in IT for an information rich society has led to the belief that existing labour intensive organisational structures are obsolete. Thus adopting computerisation can be viewed as the basic step to be adopted by these organisations so as to remain competitive and be in the mainstream.

It has always been the intention of the Malaysian Civil Service to improve its efficiency. Through the numerous ministries, departments, authorities, agencies and organisations under its jurisdiction, various measures are introduced and implemented. The recent development in computerisation is one of the means to upgrade its services.

Though Malaysia plans to be an industrialised nation by the year 2020, the agricultural sector at present is and will still be, the backbone of the nation. Though the development in the nation's economy is spearheaded by the industrial sector, development in agricultural sector is still and continued to be given priority. As such, the production capacity and competitiveness in this sector are optimised. Being an agricultural country, development is focused more on the efforts of uplifting better quality production levels via new technology diffusion. Similarly, in agricultural marketing, the adoption of computer usage aims to stimulate higher levels of achieved business transactions through prompt and appropriate decision-making. This can be enhanced through the availability of the current market information.

Information technology is gradually becoming more important which brings new shift in technological epoch and paradigm. Agriculture has to adopt and internalise IT dimensions and computerisation so that intensification of agribusiness and bio-industrialisation enterprises can be enhanced. In other words, the production process and consumerism will be matched and accelerated. The resultant effect in the long run will be capital accumulation on the production side and the efficient utilisation of agricultural products on the consumption side. Information

technology is viewed as an alternative means of improving and bridging the supply and demand requirements. Better productivity could be brought about by optimising computerisation. In the ideal situation, such productivity increase can help reduce income inequality in the society.

Usually, it is the progressive individuals that are more accessible to IT innovations. They are the ones who are able to harvest the immediate profitability of an innovation. Unlike in agriculture, progressive farmers serve as local demonstrators in their farms but not so with the personnel in the agricultural organisations. The latter operate in their own sphere and rarely they voluntarily serve as computer application demonstrators. Most adoption and applications remain confined to themselves. In most diffusion of innovations, the primary recipient of the technology-transfer oriented development programmes are those having better education, exposure and available resources (Boonsom, 1995).

The rapid advances in computerisation contribute to some forms of 'organisational cultural shocks' in terms of its adoption. Though computerisation in most organisations is viewed as desirable if not vital, yet its inception differs among them. Various and different factors come into play with varied magnitudes and consequences. In the agricultural sector, the legislative and regulatory functions are undertaken by the various departments and agencies under the Ministry of Agriculture. The actual business matters are more left to the private sector. Agricultural marketing operates in a free-open scenario, with most regulatory and legislative functions within the public sector while the rest being taken up by the private sector. Due to this prevailing nature, operation and *modus operandi*, the